

The important fact revealed by these specimens shows that the genus must be moved from the subfamily *Hyriinæ* and placed in the subfamily *Unioninæ*.

Two species of *Parreysia* (*P. corrugata*, and *P. wynegungaensis*) were received (numerous specimens) bearing eggs in all four gills, as in *Quadrula*. That these shells would be found bearing ova in all four gills was prophesied as being probable by Mr. Simpson (Synopsis, page 508).

The important bearing of this fact is that it proves that *beak sculpture and manner of carrying ova in the gills are not correlated*.

In this connection Mr. C. T. Simpson wrote (in a letter) several years ago that gravid animals of the group of *Unio* (*Nodularia*) *caffer* Krauss proved to carry eggs in their *outer gills*, and thus necessitated the moving of this group from the subfamily *Hyriinæ*, genus *Nodularia*, to the subfamily *Unioninæ*, genus *Unio*.

But in the light of further knowledge we see that our definition of the subfamily *Hyriinæ* (as differentiated from *Unioninæ*) must be amended. We must choose between beak sculpture ("radial *versus* concentric") or marsupial characters ("Exobranchiæ *versus* Endobranchiæ") in our definitions.

The judgment of the writer would be to drop the *marsupial* feature and adhere to the beak sculpture, thus giving for our definition of the subfamily *Unioninæ*: "Essentially concentric beak sculpture," and for *Hyriinæ*: "Essentially radial beak sculpture." Thus amended, the group of *Nodularia caffer* Krauss remains undisturbed, as originally located by Mr. Simpson.

DESCRIPTIONS OF TWO NEW AMERICAN PUPIDÆ.

BY V. STERKI.

VERTIGO NYLANDERI n. sp.

Shell perforated, oblong, with a rather acute apex, of deep horn color, pellucid; whorls $4\frac{1}{2}$ -5, quite convex, with a deep suture, with sub-regular, crowded striæ (except the embryonal), the last occupying about one-half of the altitude, gradually narrowed towards the aperture, which is small; peristome slightly everted, margin not thickened; palatal wall with an indentation barely above its middle, forming a well-marked sinus and sinulus; behind it a trace of a crest, and behind that a long, deep furrow-like impression over the palatal

folds, ascending obliquely from near the base; no callus within; lamellæ and plicæ 6; parietal rather long and curved; parallel with it is a thin, lamelliform angular; columellar and inferior columellar rather small, short, the latter near the base; palatals long, the lower deep-seated, ending close to the beginning of the upper, one appearing to be a continuation of the other.

Alt. 1.6, diam. 0.9 mm.

Soft parts not seen.

Woodland, Aroostook county, Maine, collected in 1896 by Mr. Olof O. Nylander, in whose honor the species is named. I have two specimens on hand, the types (No. 1075 of my collection of North American *Pupidæ*); a few more are in the collection of Mr. Nylander. Ever since '96 the form was regarded as distinct, but not published. The two specimens are alike, mature and perfect, and cannot be deformed ones of some other species. In appearance and surface striæ they are somewhat like *V. gouldii* Binn., but otherwise the shell is quite different. In its shape, with the narrowed last whorl, it somewhat resembles *V. oscariana* St., but the lamellæ and plicæ are very different.

BIFIDARIA CLAPPI n. sp.

Shell glossy, colorless to milky-whitish, perforate, cylindrical in the lower 3-4 whorls, conical or subconical above, with a rather acute apex; whorls $6\frac{1}{2}$ - $7\frac{1}{2}$, the upper ones rather narrow, the lower ones broader and less convex, the last moderately large, ascending at the aperture, somewhat narrow but rounded at the base, slightly flattened over the palate; surface shining, with slight irregular to sub-regular striæ; aperture nearly oval, margins approximate; peristome everted, not thickened, but there is a slight to rather strong white callus in the palate; lamellæ and plicæ: parieto-angular distinctly complex, rather long, moderately elevated, connecting with the peristome near its outer upper terminus (much as in *B. armifera*), the spur¹ of the parietal moderately large; columellar axial spiral, with the lower end nearer the aperture, thicker and rather abrupt, or somewhat bifurcate; "basal" (inferior columellar) slight or wanting;

¹ In *B. armifera* and *clappi*, near the inner end of the parietal lam., there is a process, or "spur," outward, that is, towards the periphery, at nearly right angles, smaller or larger, generally visible in front view. So far it has been seen in no other species; but in *B. contracta* there is a protracted, curved part, lower than the rest of the lam., and not visible in front view.

upper and lower palatals regular, an interpalatal in many specimens; suprapalatal wanting or quite small.

Alt. 3.5-4 (rarely 3.2-3.4), diam. 1.9-2.1 mm.; aperture alt. 1.5, diam. 1.2 mm.

Soft parts, seen only from one dried Alabama specimen, soaked, very dark from copious, deep brown pigment. Jaw amber-colored, strongly curved, rather broad, rounded at the ends, its surface with numerous radial rib-striæ; the line of the attachment of the tenaculum strong.

Radula with 78 transverse rows of 27 (or 29) teeth, $r + 6 + 7$ (8); rachidian rather narrow, with a short mesodont and very small ectodonts (barely visible); laterals bicuspid, with the mesodont as long as the plate, the ectodont about one-third as long; the outer posterior angle of the plate raised, cusp-like; seventh and eighth with the ectodont split in two, somewhat intermediate or "transition" teeth; marginals (9-13) serrate, with the mesodont rather long, thin; the fourteenth a barely visible irregular transverse bar, or wanting. As this is from a single specimen, there may be some variation. Other parts could not be examined.

Habitat: Knoxville (various localities); eastern Tenn.; Fayetteville and Columbia, Tennessee; Gurley and Huntsville, Alabama; Grand Rapids, Michigan; "Ottawa, Illinois."?

The species shows little variation, except in altitude, with nearly the same diameter, and such as are noted in the description. There is no tendency towards having the peristome continuous. The types are from Knoxville, Tenn., but almost any good specimen seen from anywhere might be taken for a type.

B. clappi is remarkable for its resemblance to some forms of *B. armifera* Say, for a variety of which it has been taken. Yet it is quite distinct. Of over 150 specimens carefully compared with more than 1500 *armifera* not one was found doubtful or intermediate. The most tangible difference is in the shape of the columellar lamella. The shell averages somewhat smaller, the apex is more acute, the surface striæ are finer and slighter, the lower palatal plica is always

¹ *B. armifera* shows considerable variation with respect to size and shape, and in connection with it, in the shape of the columellar and lower palatal. These differences mark two main forms, varieties at least, the shell of one of them being more cylindrical and more or less resembling *clappi*, but the columellar (and lower palatal) are always different.

regular.¹ When one is once familiar with the species it is easily recognized. There is no doubt that specimens are in various collections as, and mixed with, *armifera*, and all such lots should be revised.

Specimens, as "*Pupa armifera*," were received in 1886-92 from the late Mrs. Geo. Andrews, collected at Knoxville, Tenn., at various places, marked: "Garden," "The Thicket," "under stones," aggregating 58 *armifera*, 51 *clappi*. In a lot of 32 from drift on the Duck river, Columbia, Tenn., sent by Prof. B. Shimek in 1892, 18 were *armifera* and 14 *clappi*; 5 specimens, of the latter only, from "Columbia, Tenn.," were received from Mr. A. A. Hinkley in 1887. Lately Mr. Geo. H. Clapp was kind enough to send me all his *armifera* for inspection; among them was a lot from "Eastern Tennessee," all *clappi*; one from Gurley, Ala., the same; and one from Huntsville, Ala., with 36 *armifera* and 1 *clappi*. The latter two were collected by Mr. Herbert H. Smith. Mr. Bryant Walker also kindly sent me his whole *armifera* material, 37 lots. Among them were *clappi* from Fayetteville, Tenn., and Huntsville, Ala., and, much to my surprise, from Grand Rapids, Mich. Also in a lot from "Ottawa, Ill.,"? which I owe to Mr. F. C. Baker, both species were represented. It seems then that the distribution of *B. clappi* is not only southeastern, as had been supposed, and it may be found in other parts of the country also.

I take pleasure in naming the species in honor of Mr. Geo. H. Clapp.

STRANGE SHELLS. One specimen: Umbilicate, cylindrical-turriculate; whorls $6\frac{2}{3}$, moderately convex, the last occupying nearly one-half of the altitude; aperture higher than wide, somewhat like that of *Cionella lubrica* except for the columellar part; peristome straight, thin and sharp; no trace of lamellæ and plicæ; colorless to pale horn; shell thin, translucent; surface with fine, irregular striæ; alt. 4, diam. 2 mm.; aperture alt. 1.5, diam. 1 mm.; umbilicus round, of about 0.5 mm. diam., and pervious into the preceding whorls. From Rose Hill, near Buffalo, N. Y., collected and sent by Miss E. L. Letson in a lot of *Bifid. armifera* Say, var. What is it? If it came from a foreign country, or even from some unexplored part of our own continent, one might be tempted to regard it as representing a n. sp., and even a new genus. But in all probability it is a freak, or monstrous specimen of *Bifid. armifera*. This had been written when I received, from Mr. Clapp, a somewhat corresponding

specimen, from Gastonburg, Ala. It was plainly a *B. armifera*, large, especially the last whorl, much larger than the penultimate, evidently overgrown, with a very small and slight parietal lam. A specimen, corresponding especially with the first-mentioned, of *Bifid. corticaria*, from Jackson county, Ala., was received years ago from Mr. H. E. Sargent. 3.1 mm. high; peristome straight and thin; aperture without a trace of lamellæ.

REV. A. B. KENDIG, D. D.

Dr. Amos B. Kendig, one of the best known Methodist clergymen of New England, died January 20, 1909, at Brookline, Mass.

Dr. Kendig was born in Lancaster county, Penna., in 1830, removing to Iowa when a young man. He at first studied law, but changed to the ministry, and was ordained in 1852. In the Civil War he served for a time as chaplain of the 9th Iowa regiment.

In 1875 Dr. Kendig came to Boston and became pastor of the Monument Square M. E. Church in Charlestown. Later he held pastorates in Lynn, Worcester and Boston; then going to Brooklyn, N. Y., East Orange, N. J., and New York City.

Dr. Kendig was known for his energy in all that he undertook. He was a man of devout Christian character, and he brought to his profession the courtesy and the manners of a gentleman of the old school. A man of broad culture and sympathy, he took great interest in scientific matters, and was a member of several learned societies. He took up the study of mineralogy at one time, and made a large and fine collection of minerals, which he presented to a college in Iowa. Later he made a study of land shells of the world, built up a large and valuable collection, and accumulated a library. In 1903 he decided to give up the study of shells, his collection going to the Franklin and Marshall College, Lancaster, Pennsylvania. Dr. Kendig had many warm friends among conchologists. He is survived by two daughters, Mrs. George F. Kellogg and Mrs. Silas Peirce.

SUPPLEMENTARY NOTES ON THE BREEDING SEASONS OF THE UNIONIDÆ.

BY CHAS. H. CONNER.

Dr. A. E. Ortmann's article, relative to the breeding seasons of the *Unionidæ*, will doubtless be received as an interesting and valuable contribution to the subject, and in order to extend its usefulness, so far as my limited ability will permit, I beg to present a condensed report of my observations, made from 1905 to 1908 inclusive. I, too, have noticed some apparent variations in the breeding periods of individuals, as also in the species, in different years. Possibly this